

Serial No. 10/042,151
Amdt. dated January 16, 2004
Reply to Office Action of October 16, 2003

Docket No. P-0329

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A water circulation cleaner, comprising:
 - a main case;
 - a suction head ~~combined to the~~ installed at a lower side portion of the main case, ~~having comprising~~ a suction port ~~configured~~ to suck foreign materials ~~debris~~ and fluid existing on a from a surface of a cleaning object surface into the suction port;
 - an impeller assembly installed at one side of the main case, ~~for generating and configured to generate~~ a suction force;
 - a filter means ~~device~~ positioned in the ~~a~~ suction passage formed between the suction head and the impeller assembly, ~~for separating foreign materials contained in suction and configured to filter out debris sucked in with the fluid~~;
 - a cleaning water tank provided in the main case and connected to the a discharging port of the impeller assembly ~~in the main case, for storing, wherein the cleaning water tank is configured to store~~ cleaning water inside therein; and

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~~an a plurality of injection nozzle nozzles positioned in the suction head, for injecting the and configured to inject cleaning water supplied from the cleaning water tank to onto the surface of the cleaning object surface.~~

2. (Currently Amended) The cleaner of claim 1, wherein further comprising a plurality of rollers are installed at the front and rear sides portions of the lower surface of the suction head and configured to ease moving provide for movement of the cleaner.

3. (Currently Amended) The cleaner of claim 1, wherein the suction head has either comprises at least one of a brush member or and a duster member to remove foreign materials being abutted to the cleaning object on the lower surface.

4. (Currently Amended) The cleaner of claim 3, wherein the at least one of a brush member and a duster member are composed configured to remove foreign materials debris from the cleaning object.

5. (Currently Amended) The cleaner of claim 1, wherein the suction head has further comprises a blade for preventing configured to prevent an outflow of the cleaning water

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injected from by the plurality of injection nozzle in the outer nozzles to an area outside of the suction port.

6. (Currently Amended) The cleaner of claim 5, wherein the blade has a structure that it is connected is configured to be attached to the a lower surface of the suction head in the trapezoid form, and wherein the blade is substantially trapezoidal in shape.

7. (Currently Amended) The cleaner of claim 6, wherein the suction head has either comprises at least one of a brush member or and duster member configured to remove foreign materials being abutted to debris from the cleaning object on the lower surface and wherein the suction port is formed at the upper and rear side of the a portion of the suction head which is to a rear of where the at least one of a brush member and the a duster member are installed.

8. (Currently Amended) The cleaner of claim 7, wherein the plurality of injection nozzle is nozzles are positioned between the suction port positioned at the a front portion of the suction head and the at least one of a brush member or the and a duster member.

9. (Currently Amended) The cleaner of claim 5, wherein the blade has a oval comprises an elliptical structure that it is connected to the a lower surface of the suction head.

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10. (Currently Amended) The cleaner of claim 9, wherein the suction port is formed as an oval in a substantially elliptical shape ~~in the~~ within an internal area of formed by the blade.

11. (Currently Amended) The cleaner of claim 10, wherein at least one ~~between the~~ of a brush member ~~or and a~~ duster member is installed ~~at the inner side~~ within an internal area of formed by the suction port.

12. (Currently Amended) The cleaner of claim 40 11, wherein the plurality of injection nozzles are formed between the suction port and the at least one of a brush member ~~or and a~~ duster member.

13. (Currently Amended) The cleaner of claim 5, wherein the blade ~~has further comprises~~ an end blade abutted to the bottom surface formed extending from the lower end portion of the blade and sloped inward where toward the suction port is positioned.

14. (Currently Amended) The cleaner of claim 1, ~~wherein the further comprising a suction pipe for forming~~ configured to form a suction passage between the suction head and the filter mean is connected device, and a backward-flow-preventing valve for preventing configured to prevent a backward flow so that of the cleaning water does not move backwardly.

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15. (Currently Amended) The cleaner of claim 14, wherein the suction pipe ~~has comprises~~ an expansion pipe ~~formed~~ expanded in the ~~a radial~~ direction of the radius in the middle of itself in a center portion thereof.

16. (Currently Amended) The cleaner of claim 1, wherein the filter ~~means~~ device is combined configured to be coupled with the impeller assembly outside the main case.

17. (Currently Amended) The cleaner of claim 1, wherein the filter ~~means~~ is composed of the device comprises a hydro-cyclone dust collection structure.

18. (Currently Amended) The cleaner of claim 17, wherein the filter ~~means~~ is composed of device comprises a dust collection case ~~having, wherein~~ a radius narrowed along from the of the dust collection case becomes more narrow as it goes from an upper area to the to a lower area portion of the dust collection case, so as to form a cyclone dust collection structure by due to a gyration movement of fluid.

19. (Currently Amended) The cleaner of claim 18, wherein the dust collection case ~~has comprises~~ a protrusion port for sucking the configured to suck cleaning water containing foreign materials on the upper side surface debris, and an impeller suction tube formed

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extending vertically lengthened from an upper central portion of the impeller assembly at the upper central portion.

20. (Currently Amended) The cleaner of claim 19, wherein the protrusion port is formed protruded in the a direction of a line tangent line of to a flat surface of the dust collection case from a flat surface.

21. (Currently Amended) The cleaner of claim 19, wherein the protrusion port is formed sloped downward in the a direction to the of an inner side of the dust collecting collection case.

22. (Currently Amended) The cleaner of claim 1, wherein the filter means has a filter member in device comprises a filter case and accordingly configured to receive a filter member configured to filter out debris when cleaning water sucked to into the filter case passes through the filter member foreign material is filtered.

23. (Currently Amended) The cleaner of claim 22, wherein the filter means device further comprises:

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a filter case having a protrusion port formed on the a side surface of the filter case
and configured to suck cleaning water into the filter case; and

a cap separably attached to an upper portion of the filter case proximate where
an impeller suction pipe of the impeller assembly passes, being combined at the upper portion
of the filter case separably, and

a filter member for filtering foreign materials.

24. (Currently Amended) The cleaner of claim 22, wherein the filter member comprises:

a first filter member positioned at the an inner lower portion of the filter case,
having comprising a relatively small number of meshes and configured to filter foreign materials
out debris with a large particles particle size; and

a second filter member positioned at the a side of the impeller suction pipe,
having comprising a relatively large number of meshes than compared to the first filtering
filter member and configured to filter out debris foreign materials with a small particles particle
size.

25. (Currently Amended) The cleaner of claim 1, wherein the impeller assembly comprises:

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an impeller housing fixed to the main case;
an impeller ~~for generating~~ configured to generate a force ~~for flowing which causes~~ cleaning water containing foreign materials debris which have passed through the filter means at the lower inner portion of the impeller housing device to flow; and
a driving motor installed at the an upper inner portion of the impeller housing, ~~for rotary operating and~~ configured to provide a rotary driving force to the impeller.

26. (Currently Amended) The cleaner of claim 25, wherein the impeller assembly further comprises [[:]] a sealing means device positioned between the impeller and the driving motor ~~for preventing and~~ configured to prevent an inflow of the cleaning water to the driving motor.

27. (Currently Amended) The cleaner of claim 1, wherein the cleaning water tank is formed in a substantially cylindrical shaped lengthened in the vertical direction, ~~being and~~ connected with to an inflow tube connected to the impeller assembly and an outflow tube connected to the plurality of injection nozzle nozzles.

28. (Currently Amended) The cleaner of claim 27, wherein the inflow tube ~~has~~ includes a pressure drawing means ~~for lowering~~ device configured to lower a pressure between

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an exhaust side of the impeller and the cleaning water tank by being opened when the pressure between the exhaust side area of the impeller assembly and the cleaning water tank reaches a certain predetermined level.

29. (Currently Amended) The cleaner of claim 28, wherein the pressure drawing tube device comprises:

a pressure drawing tube diverged from the inflow tube and connected to the outside an outer portion of the main case; and

a pressure valve installed in the pressure drawing tube, being opened and configured to open when the pressure between the exhaust side of the impeller and the cleaning water tank reaches a certain the predetermined level.

30. (Currently Amended) The cleaner of claim 27, wherein an open/close valve for opening and closing the configured to open and close the cleaning water tank is installed in the outflow tube and is configured to prevent an outflow of the cleaning water stored in the cleaning water tank.

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31. (Currently Amended) The cleaner of claim 1, wherein further comprising:
a supply tube ~~communicating with the~~ in communication with an outside of the
main case ~~is and~~ connected to the cleaning water tank, wherein the supply tube is configured to
fill the cleaning water tank with cleaning water; and
a cap ~~is installed in the~~ an inlet portion of the supply tube and configured to close
the closing cleaning water tank.